the Examiner, Applicant instead submits a clean copy of the surrounding paragraphs, showing the absence of the deleted paragraph.

3. Rejection of Claims 25 and 29-31 Under 35 USC §112, 1st Paragraph

The rejection of claim 25 has been rendered moot by its cancellation.

However, the rejection of claims 29-31 has been addressed by deleting the incorrect references to "residual area base" and amending these claims to refer either to a "micro-engraving" and "roughness structure" rather than the "residual area base."

Basically, the "roughness structure" is the structure left over when the "residual area" is removed, and the term "micro-engraving" refers to the substructures in the flanks *or* base that are added after the residual area is removed.

More specifically, the claims and/or specification have been amended to consistently define the following terms:

a.	Residual Area:	The area 16 illustrated in **Fig. 6a** that is left when line 28 is engraved.
b.	Defined Roughness Structure:	The surface structure illustrated in **Fig. 6b** that results from removal of residual area 16. It is defined in lines 6-9 on page 6 of the original specification.[1]
c.	Residual Area Base:	This is the base of the residual area, in which the "defined roughness structure" is defined. This terminology has been replaced in the claims by the

[1] *"To remove residual area 16 one can use any method but preferably one of the above-described. Regardless of the particular method one produces at the base of the residual area engraving a* ***defined roughness structure*** *determined by the offset and form of the engraving tool. Fig. 6(b) shows such a roughness structure. . . ."*

term "defined roughness structure," as suggested by the Examiner.

d. Micro-Engraving: Micro-engraving refers to sub-structures in the residual area base, as in Figs. 7 and 8, or in the flanks, as in Fig. 9.

Not consistent even here!

The Examiner is correct that the substructures are different from the "residual area base," and the claims have been amended accordingly. The substructures are lines engraved into lines, as shown for example in Fig. 7. The residual area base, on the other hand, is the portion of the depression left over when residual area 16, shown in Fig. 6(a), is removed. To avoid confusion, the term "residual area base" has been deleted from the claims and replaced by the term "defined roughness structure." Support for the phrase "defined roughness structure" is found in lines 6-9 on page 6 of the original specification:

> *To remove residual area 16 one can use any method but preferably one of the above-described. Regardless of the particular method one produces at the base of the residual area engraving a* ***defined roughness structure*** *determined by the offset and form of the engraving tool. Fig. 6(b) shows such a roughness structure. . ..*

In addition, the term "micro-engraving" is now used to refer to the lines within lines discussed on pages 7-9 of the specification, and illustrated in Figs. 7, 8, and 10. Although the specific term "micro-engraving" is first used in lines 14-18 on page 9 of the original specification, it is clear that the term also applies to the "roughness structures at the base of the engraving or additional information," which are shown in Figs. 7 and 8. Page 9, lines 14-18 specifically states that the roughness structures "can be call micro-engraving in the present case," while the roughness structures of Figs. 7 and 8 are described as *alternative* to the substructures of Fig. 10 as evidenced by page 9, lines 17-18, which point out that the method of forming substructures illustrated in Figs. 7 and 8 "*can of course <u>also</u> be used to modify the flanks of the engraving along the desired contours.*"

It is noted that the "roughness structures" originally defined on page 9 are not the same as those originally defined on page 6, and discussed above. To eliminate this source of confusion, page 9, lines 14 *et seq.* has been amended to consistently use the term "micro-engraving" rather than "roughness structures" to refer to the sub-structures of the main engraving, whether in the base as in Figs. 7 and 8, or in the flanks as in Fig. 10.

To clarify that the term "micro-engraving" refers to further engraving of the bottom of the depression or the flanks of the depression, as illustrated in Figs. 7, 8, and 10, while eliminating the confusing reference on this page to "roughness structures," page 9 has been amended as follows:

> Although the use of different engraving tools already provides a wealth of possibilities for bringing into the embossing plate substructures in the form of defined roughness structures at the base of the engraving, as shown in Figs. 6b and 6c, or additional information resulting from the second engraving described above and illustrated in Figs. 7 and 8, which can be called micro-engraving in the present case, the inventive method can of course also be used to modify the flanks of the engraving along the desired contours. Fig. 10 shows an example of bringing [substructures] micro-engraving into the flanks of the [embossing plate] depression shown, for example, in Figs. 6b and 6c, whereby an engraving consisting in the present case of flank 28 and engraving 29 located on the bottom of the depression is brought into embossing plate 15 and, in an additional operation, [specific substructures made up of] additional information in the form of so-called [sub- or] micro-engraving or microstructure lines 30 was brought into flank 28. The flank of the engraved line, like the bottom of the engraved lines as described above in connection with Figs. 7 and 8, can thus be provided with an additional information content which can consist for example of simple lines, a step function, characters, patterns, pictures or the like. In particular, in the case of gently sloping flanks 28 it is therefore also possible to bring additional information into the flank of an engraved line which extends downward from desired contour line 26.

It is respectfully submitted that these amendments overcome the ambiguities noted in the rejection under 35 USC §112, 1st Paragraph, and yet do not involve new matter. Withdrawal of the rejection is therefore respectfully requested.

4. Rejection Under 35 USC §112, 2nd Paragraph

This rejection has been addressed by revising the claims to correct various antecedence errors and to use the corrected terminology noted above, in particular the term "defined roughness structure" as suggested by the Examiner in the penultimate paragraph on page 5 of the Official Action. It is noted that the language added to claim 3 is taken from lines 20-22 on page 2 of the original specification.

5. Rejection of Claims 24, 25, 28-33, and 41 Under 35 USC §102(b) in view of U.S. Patent No. 2,210,923 (Jacquerod) or Under 35 USC §103(a) in view of the Jacquerod Patent and U.S. Patent No. 4,972,323 (Cauwet)

This rejection is respectfully traversed on the grounds that:

1. Claim 24 recites "an **engraved defined** roughness structure at a bottom of said at least one depression," whereas the Jacquerod patent discloses an **etched** roughness structure which is **random** rather than defined;

2. The positively recited "engraved defined roughness structure" is not a product-by-process limitation, but rather is a structural limitation since engraved and etched roughness structures have different structural characteristics that are easily discernible to those skilled in the art, etched roughness structures being irregular, randomly distributed, and irreproduceable while engraved roughness structures are regular and "defined";

3. The apparently regular row of stipples at the edges of the depression in Fig. 3 of Jacquerod is an artifact of the draftsman and not a possible configuration in practice, since it is impossible to achieve such a regular structure using the etching techniques set forth in Jacquerod;

4. Not only is the "defined roughness structure" a distinguishing structural feature, but so is the "engraved depression" since engraved and etched depressions have different structural characteristics that clearly define the respective types of structures–engraved and etched being adjectives with clearly defined meanings that are no less "structural" in nature than "smooth" and "rough," "elongate" and "spherical," and so forth;

not what rej says

5. Cauwet neither discloses nor suggests substitution of an engraved structure of the type claimed for the etched structure of Jacquerod, but to the contrary simply concerns engraving of small ornamental or utility objects such as medals, jewelry or portraits using a conventional engraving technique lacking defined roughness structures formed within depressions, as claimed.

not rejected on

In making the rejection, the Examiner dismisses the recitations of engraved depressions and roughness structures on the grounds that they are method limitations. This characterization of the adjective "engraved" as a method limitation is respectfully traversed. While the characterization would be a valid if the claims were in fact "product-by-process" claims, *i.e.*, if otherwise structurally identical products were distinguished solely by the method of making, engraved structures are in fact **not** structurally identical to etched structures. To the contrary, they are easily distinguishable to those skilled in the art because etched roughness structures are inherently irregular, unlike the claimed defined roughness structures.

It is common to use verbs turned-into adjectives to define structures, and the fact that the words were originally verbs does not prevent their interpretation as structural limitations. For example, one would not interpret "cast iron" as a method limitation, even though it refers to a process of iron forming (casting). Similarly, woven cloth is structurally different than knitted cloth, toasted bread is structurally different than untoasted bread, a roughened surface is different than a polished surface, and so forth. So long as the terms used in a claimed define structural features, they should be taken into account by the Examiner, even if the roots of the adjectives happen to be verbs. Etching is clearly a distinguishable process from engraving, and the resulting structures are inherently different.

It is noted that at one point in the Official Action, the Examiner indicates that "engraving" is a type of "etching." According to the Examiner, "*regarding applicant's assertion that Jacquerod teaches 'etching' rather than engraving, it is noted that as the etching removes the material from the plate, the etching is a form of 'engraving' that would be encompassed by the*

current claim language" (page 19, lines 3-5 of the Official Action). Such creative stretching of word meanings for the purpose of rejecting the claims is unfair. Etching is clearly a chemical process involving acid. Engraving is a mechanical process.

For example, *Webster's Ninth New Collegiate Dictionary* defines "etch" as follows:

> *[1]etch. . .1 a: to produce esp. on metal or glass by the corrosive action of an acid b: to subject to such etching*
> *[2]etch. . .1 a: the action or effect of an etching acid on a surface*

These definitions do not read on "engraving," which is defined as:

> *1 a: to form by incision (as on wood or metal) b: to impress deeply as if with a graver*

("graver" being defined as "*1: SCULPTOR ENGRAVER 2: any of various cutting or shaving tools used in graving or in hand metal-turning*").

While these are definitions from a general purpose dictionary, and not a chemical or scientific dictionary, the terms have the same meaning to those skilled in the art. Furthermore, an "etched" product is clearly one that results from the application of acid, and not from engraving.

In the present case, Jacquerod's etched and stippled structures are structurally distinguishable from the engraved structures of the claimed invention. Therefore, Jacquerod cannot anticipate the invention as presently claimed. To reject the claims because solely because the descriptive terminology used originated as verbs is unreasonable. Etched, stippled structures of the type disclosed by Jacquerod are easily recognizable by those skilled in the art because of the randomness of the "roughness structures." Each time etching occurs, the etching fluid will etch a different pattern. In contrast, engraved structures follow straight lines and smooth curves due to limitations in motion of the etching tools. As a result, the ordinary artisan would never mistake an etched depression and etched roughness structures for an engraved depression and defined roughness structures formed by engraving. A "**product-by-process limitation**" is one in which the product is distinguishable **only** by the manner in which it is made, and not one in which the product is distinguishable by structural differences resulting from the different methods. When claimed combinations have clearly distinguishable structures, then one cannot anticipate the other.

It is true that some of the raised structures shown in Fig. 3 of Jacquerod appear to be aligned. However, such alignment of etched structures, even at the edges of a depression, could never happen in practice, and cannot be considered to be "defined," as claimed, since they are created by using acid to break down an ink coating, the random manner in which the acid breaks down the ink resulting in the stipples. To modify this process by dispensing with the etching would be diametrically contrary to the teachings of Jacquerod, which explicitly seeks to avoid the expense and labor involved in engraving (in the absence of Applicant's teaching that engraving in fact is a suitable and desirable way of forming roughness structures at the bottom of a depression).

The Examiner is reminded that a reference must be considered as a whole, and that it is not permissible to ignore portions of a reference that teach away from the claimed subject matter. As explained in **MPEP 2143.02**:

> *If the proposed modification or combination of the prior art would* ***change the principle of operation of the prior art invention being modified****, then the teachings of the references are not sufficient to render the claims prima facie obvious* (citing In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)...*The court reversed the rejection holding the "suggested combination of references would require a* ***substantial reconstruction and redesign*** *of the elements shown in [the primary reference]* ***as well as a change in the basic principle under which the [primary reference] construction was designed to operate****" 123 USPQ at 352.* (See also, MPEP 2141.02, p. 2100-107 "**A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention** (emphasis in the original).

In the present case, the Jacquerod patent clearly teaches an etched method that results in random rather than defined roughness structures, and therefore Jacquerod cannot be said to anticipate the claimed invention.

Furthermore, the Cauwet patent does not include any teachings that would have caused the ordinary artisan to ignore the teaches of Jacquerod concerning etching, and in particular does not in any way suggest the claimed feature of *engraved* defined roughness structures in an *engraved* depression, as claimed. Certainly, neither Cauwet nor Jacquerod even remotely

considered the possibility of engraving roughness structures into an engraved depression for the purpose of facilitating numerical control and reproducibility of plate formation, and there are no other reasons apparent in either of the references that would have caused the ordinary artisan to make the proposed combination.

Because neither Jacquerod nor Cauwet discloses the claimed combination of positively recited structural features, including engraved depressions and engraved and defined roughness structures formed therein, withdrawal of the rejection of claims 24-25 and 28-35 under 35 USC §§102(b) or 103(a) is respectfully requested.

6. Rejection of Claims 24-25, 28-33, and 41 Under 35 USC §§102(b) or 103(a) in view of U.S. Patent No. Re. 28,747 (Graboyes), and/or of Claims 32 and 33 in view of Graboyes and Cauwet

This rejection is respectfully traversed on the grounds that:

a. Graboyes concerns engraving of a printing wheel and not an embossing or intaglio plate; ~ See rej.

b. The engraving methods of Graboyes do not engrave depressions in a printing plate, whether intaglio or not, having defined roughness structures at the bottom of the engraved depressions, but to the contrary serve the precise forming of the radius of the inside corner of the depression. The bottom of the engraved depression designated with reference numeral 112 in Graboyes is always flat and smooth. → See rej.

c. Formation of roughness structures in the printing wheel of Graboyes would actually degrade its performance, since if there were roughness structures present on the bottom or the flanks of a letter press printing plate such as plates 112 and 121 in Fig. 24 of Graboyes, these structures would, after a while, be filled with excessive printing ink which would deteriorate the printing result. In contrast, in intaglio printing plates, the depressions rather than raised surfaces are filled with printing inks and the printed picture is produced by the transfer of the printing ink

from the depressions onto the substrate, the roughness structures serving to keep the inks in the depressions; and

d. Cauwet merely teaches choices of engraving tools that could be used in the printing method of Graboyes, and does not suggest the claimed defined, engraved structures at the bottom of depressions, which would only have a negative effect on the printing method of Graboyes.

According to the teachings of Graboyes, the inside radius of a depression is engraved by a plurality of depths (see Figs. 22 and 23) so as to form steps in the corners of the flanks of the depression. These steps are subsequently **removed** in a separate manufacturing step, the resulting depression being flat and smooth not only at the bottom and the flanks but also in the inside corners of the flanks (col. 9, lines 47 to 68, and the cross-sectional view of Fig. 24). This is because in the type of letter printing disclosed by Graboyes, which involves directly application of ink from the surface of the engraved structure to a printing medium, sharpness of corners is critical while the bottoms of the depressions are not critical to the end result (except for the negative effect of retaining excess printing ink). As a result, Graboyes could not logically be suggestive of (or anticipate) structures designed to retain printing ink, the amount of ink in the depressions being critical to the end result, which involves transferring the ink **from the depressions rather than from the raised portions** onto a substrate.

The Examiner is reminded that, as stated in **MPEP 2143.02** (page 2100-111):

> *If the proposed modification would render the prior art invention being modified* ***unsatisfactory for its intended purpose****, then there is no suggestion or motivation to make the proposed modification*" (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)).

The claimed invention has no advantages in the raised printing context of Graboyes, and significant potential disadvantages, and therefore Graboyes could not possibly have anticipated or suggested the present invention. In addition, it is respectfully submitted that the contrary objectives of Graboyes would not have been contradicted by Cauwet since Cauwet merely discloses engraving tools that could be used in connection with the method of Graboyes, and

does not suggest modifying a letter printing plate to include roughness structures at the bottom of depressions surrounding the raised structures that perform the actual printing.

7. Rejection of Claims 1-10, 12-14, 16-18, 21, 22, and 37-40 Under 35 USC §§102(b) or 103(a) in view of U.S. Patent No. Re. 28,747 (Graboyes) and of Claim 15 in view of Graboyes and Cauwet

This rejection is respectfully traversed on the grounds that, as indicated above, the Graboyes patent concerns a type of printing in which one would never use the claimed method of forming structures at the bottom of depressions since such bottom depressions would only interfere with printing by attracting ink, without enhancing printing since it is the raised surfaces rather than the depressions that determine print quality. Forming the depressions in the claimed manner makes no sense in the context of letter printing since letter printing of the type disclosed in Graboyes concerns definition of raised surfaces and not depressions, and Graboyes actually removes the steps formed in the depressions to achieve smoothness rather than roughness.

While intermediate steps in Graboyes involve the formation of steps at the edges of "depressions" between the raised structures (assuming for purposes of argument that the spaces around the raised surfaces can properly be called depressions), the resulting edge steps are subsequently removed. Since Graboyes is obviously concerned with smoothness, it makes no sense for Graboyes to use a method that will result in roughness structures at the bottoms of the depressions. Therefore, Graboyes could not reasonably have suggested the claimed method, which results in roughness structures at the bottoms of depressions, and withdrawal of the rejection under 35 USC §§102(b) or 103(a) is respectfully requested.

12. Rejection of Claims 1-3, 5-11, 14, 16-18, 20, 36, and 37 Under 35 USC §103(a) in view of U.S. Patent No. 4,949,270 (Shima), Claims 4, 12, 13, 15, and 39 Under 35 USC §103(a) Based on Shima in view of Cauwet, and Claims 21 and 22 Under 35 USC §103(a) Based On Shima in view of Cauwet and Jacquerod

This rejection is on the basis that Shima teaches the claimed machining at a predetermined depth, citing col. 1, lines 13-15. However, col. 1, lines 13-15 of Shima refer to

conventional cutting techniques involving zigzags, and do not involve cutting out the outline before cutting the remainder.

what reason?

The reason is that Shima does not concern intaglio printing and the considerations that apply to the claimed invention, as discussed above, do not apply to the method of Shima. To the contrary, col. 1, lines 52 to 56 point out that the zigzag tool path shown in Fig. 16 of the Shima patent is impossible in the prior art referred to in col. 1, lines 13-15 ("FIG. 16 illustrates a tool path 4 which is ideal for cutting the interior of the profile 1. The tool path does not contain unneeded path segments and cutting efficiency is high. A method of creating a tool path such as shown in FIG. 16 **is not available** in the prior art and, as a result, the machining carried out exhibits a poor cutting efficiency").

The method that is actually taught by Shima is as follows:

> *. . .the graphic cursor is successively positioned and its coordinates are inputted at selected points on the display screen by using a cursor shift key. As a result, the automatic programming section successively adopts the inputted points as a cutting starting and endpoints for linear cutting.* [col. 2, lines 49 *et seq.* of Shima].

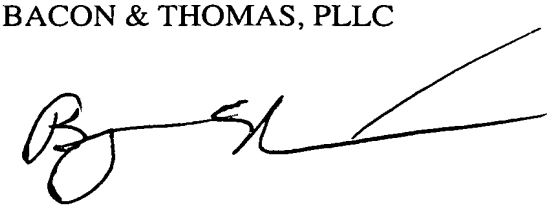
?
indeed

This method is contrary to that of the claimed invention, according to which the tool track is not calculated on the basis of certain positions which must be passed by the tool, but exclusively on the basis of a predetermined outer contour and a predetermined penetration depth. The fact that Shima's method involves successively positioning a cursor and inputting coordinates indicates that Shima's method is not predetermined based on the outer contour and penetration depth. It is based solely on stopping points, which are determined solely by moving a cursor, and which depend on the outer contour solely as a boundary condition, and not at all on the penetration depth. Thus, the Shima patent, whether considered individual or in combination with any of the references discussed above, fails to disclose or suggest the claimed invention and therefore withdrawal of the various rejections based on the Shima patent is respectfully requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

BACON & THOMAS, PLLC



By: BENJAMIN E. URCIA
Registration No. 33,805

Date: July 22, 2002

BACON & THOMAS, PLLC
625 Slaters Lane, 4th Floor
Alexandria, Virginia 22314

Telephone: (703) 683-0500

NWB:S:\Producer\beu\Pending I...P\K\kaule147398\a04.wpd

APPENDIX B
(Marked-Up Copy Of Amended Claims)

1. (Five Times Amended) A method for producing an embossing plate having a surface with at least one depression in the form of a line brought into the surface of the embossing plate, [characterized in that the line defines] comprising the steps of defining a limited partial area of the surface, an edge of the limited partial area defining a desired contour[, and wherein the method comprises the step of determining a tool track located]; calculating a tool track followed by an engraving tool within the desired contour [from] based on the desired contour and [from] a predetermined desired depth of the at least one depression[,]; and controlling movement of the engraving tool [being controlled] along said tool track such that a material of said partial area is removed within the desired contour at the predetermined desired depth, said tool track being continuous [along the contour of the area].

3. (Twice Amended) The method of claim 1, characterized in that the [desired] contour is [intersection-free] a plane element that consists of a single line of a line original.

24. (Four Times Amended) An embossing or intaglio printing plate having a surface with at least one engraved depression in the form of a line, said at least one depression having flanks, a bottom, and [a residual base area] an engraved [into said] defined roughness structure at a bottom of the at least one depression, [a width of said residual area base being smaller than a width of the at least one depression, characterized in that the residual area base] wherein said defined roughness structure is meander-shaped or extends at least in partial areas parallel to a direction of said at least one line.

28. (Thrice Amended) The embossing or intaglio printing plate of claim 24, characterized in that the [residual area base defines a roughness] at least one depression comprises micro-engraving that represents additional information.

29. (Thrice Amended) The embossing or printing plate of claim [24] 28, characterized in that the [residual area base] micro-engraving is incorporated in the form of characters, pictures, or patterns.

30. (Thrice Amended) The embossing or intaglio printing plate of claim 24, characterized in that the [residual area base] defined roughness structure represents machine readable information.

31. (Thrice Amended) The embossing or intaglio printing plate of claim 24, characterized in that the [residual area base] defined roughness structure is executed in the form of grooves.

32. (Thrice Amended) The embossing or intaglio printing plate of claim 24, characterized in that the [residual area base] defined roughness structure is brought in with the aid of a laser beam.

33. (Thrice Amended) The embossing or intaglio printing plate of claim 24, characterized in that the [residual area base] defined roughness structure is brought in with a mechanical chisel.

APPENDIX D
(Marked-Up Copy Of Amended Paragraphs)

Page 3, between lines 24 and 25:

Fig. 12 shows a schematic example of the inventive method with the rotating chisel of Fig. 4 replaced by a laser beam.

Fig. 13 shows another schematic example of the inventive method, with two rather than one rotating chisels.

[Fig. 14 is a cross-sectional perspective view of Fig. 5(b) taken at line 14-14.]

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Page 5, line 21 to Page 6, line 2:

As to be seen in Fig. 5(a), it is necessary in this case also to consider residual area 16 not removable in the first step when calculating the tool track for removing area 8. For removing residual area 16 one can determine different tool tracks depending on the desired engraving results. Thus the tool track can, as shown in Fig. 5(b), first extend along the desired contour and residual area 16 then be removed in a meander shape, the engraving tool removing the residual area continuously in meander-shaped track 17 within area 16. [Fig. 13 is the three-dimensional cross sectional view of Fig. 5(b) taken at line 14-14, showing the meander-shaped substrate.] Fig. 5(c) shows a further possibility whereby residual area 16 is removed by guidance of the engraving tool along tool tracks which are similar in the mathematical sense to tool track 12 first calculated, i.e. tool tracks 18, 19 and 20 correspond to tool track 12 in form but have a different dimension from tool track 12. Particularly in the case of curved contour lines, residual area 16 can accordingly be removed using tool tracks which extend contour-parallel, i.e. are equidistant from the contour line at each point.

Page 9, lines 14-27:

Although the use of different engraving tools already provides a wealth of possibilities for bringing into the embossing plate substructures in the form of defined roughness structures at the base of the engraving, as shown in Figs. 6b and 6c, or additional information resulting from the second engraving described above and illustrated in Figs. 7 and 8, which can be called micro-engraving in the present case, the inventive method can of course also be used to modify the flanks of the engraving along the desired contours. Fig. 10 shows an example of bringing [substructures] micro-engraving into the flanks of the [embossing plate] depression shown, for example, in Figs. 6b and 6c, whereby an engraving consisting in the present case of flank 28 and engraving 29 located on the bottom of the depression is brought into embossing plate 15 and, in an additional operation, [specific substructures made up of] additional information in the form of so-called [sub- or] micro-engraving or microstructure lines 30 was brought into flank 28. The flank of the engraved line, like the bottom of the engraved lines as described above in connection with Figs. 7 and 8, can thus be provided with an additional information content which can consist for example of simple lines, a step function, characters, patterns, pictures or the like. In particular, in the case of gently sloping flanks 28 it is therefore also possible to bring additional information into the flank of an engraved line which extends downward from desired contour line 26.